



**FLORENCE COPPER INC.**

1575 W. Hunt Highway, Florence, Arizona 85132 USA

[florencecopper.com](http://florencecopper.com)

February 9, 2022

David Albright  
Manager, Groundwater Protection Section  
USEPA Region 9 (WTR-4-2)  
75 Hawthorne Street  
San Francisco, CA 94105

**Re: Transmittal of Mechanical Integrity Testing Summary 2021  
Production Test Facility Injection Wells I-01, I-02, I-03, and I-04  
Florence Copper, Inc.; Florence, Arizona**

Dear Mr. Albright:

Florence Copper herewith transmits the enclosed technical memorandum, *Mechanical Integrity Testing Summary Production Test Facility Injection Wells: I-01, I-02, I-03, and I-04 Florence Copper Inc., Florence, Arizona.*

Please contact me if you require any additional information.

Sincerely,  
Florence Copper, Inc.

A handwritten signature in black ink, appearing to read 'Brent Berg', is written over a circular stamp or seal. The signature is slanted and written in a cursive style.

For BRENT BERG

Brent Berg  
General Manager

cc: Nancy Rumrill, U.S. Environmental Protection Agency  
Daniel Reeder, ADEQ

Enclosure



HALEY & ALDRICH, INC.  
One Arizona Center  
400 E. Van Buren St., Suite 545  
Phoenix, AZ 85004  
602.760.2450

## TECHNICAL MEMORANDUM

10 January 2022  
File No. 134160-020

TO: Florence Copper Inc.  
Ian Ream, Hydrogeological Superintendent

FROM: Haley & Aldrich, Inc.  
Laura Menken, R.G.

SUBJECT: Mechanical Integrity Testing Summary  
Production Test Facility Injection Wells: I-01, I-02, I-03, and I-04  
Florence Copper Inc., Florence, Arizona

## Introduction

This Technical Memorandum presents the results of mechanical integrity testing of Production Test Facility (PTF) injection wells I-01, I-02, I-03, and I-04 during November and December 2021 for Florence Copper Inc. (Florence Copper) in Florence, Arizona.

Injection wells I-01, I-02, I-03, and I-04 are located within the Underground Injection Control (UIC) Permitted Area of Review for UIC Permit R9UIC-AZ3-FY11-1 and were completed as Class III injection wells for the PTF (Figure 1).

Florence Copper contracted Verdad Group, LLC to perform the mechanical integrity testing, and a Haley & Aldrich, Inc. field geologist provided oversight for each test.

## Demonstration of Mechanical Integrity

Florence Copper conducted Part I mechanical integrity testing at the four injection wells by means of a Standard Annular Pressure Test (SAPT) in accordance with Part II.E.3.a.i.A of the UIC Permit. The mechanical integrity tests were performed on the dates listed below:

Well ID	Mechanical Integrity Test Date
I-01	12/13/2021
I-02	11/30/2021
I-03	12/06/2021
I-04	12/17/2021

Completed SAPT forms are included in Appendix A. As-built diagrams are provided in Appendix B.

## **Results**

Each of the four injection wells passed mechanical integrity testing. Results of the tests are presented in the completed SAPT forms (Appendix A).

### **Enclosures:**

Figure 1 – Well Locations

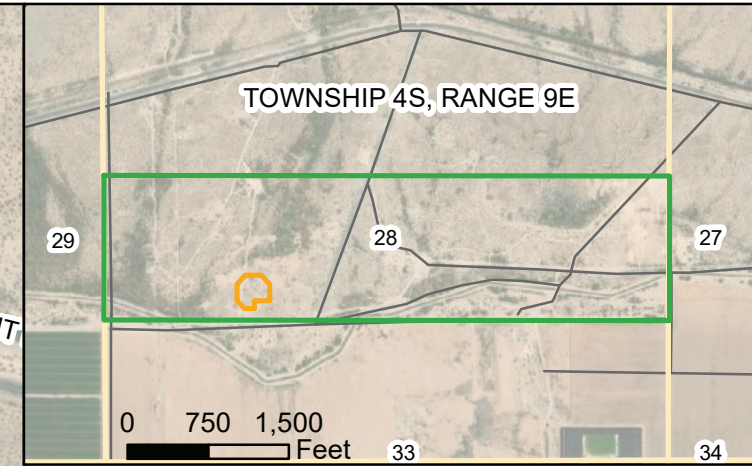
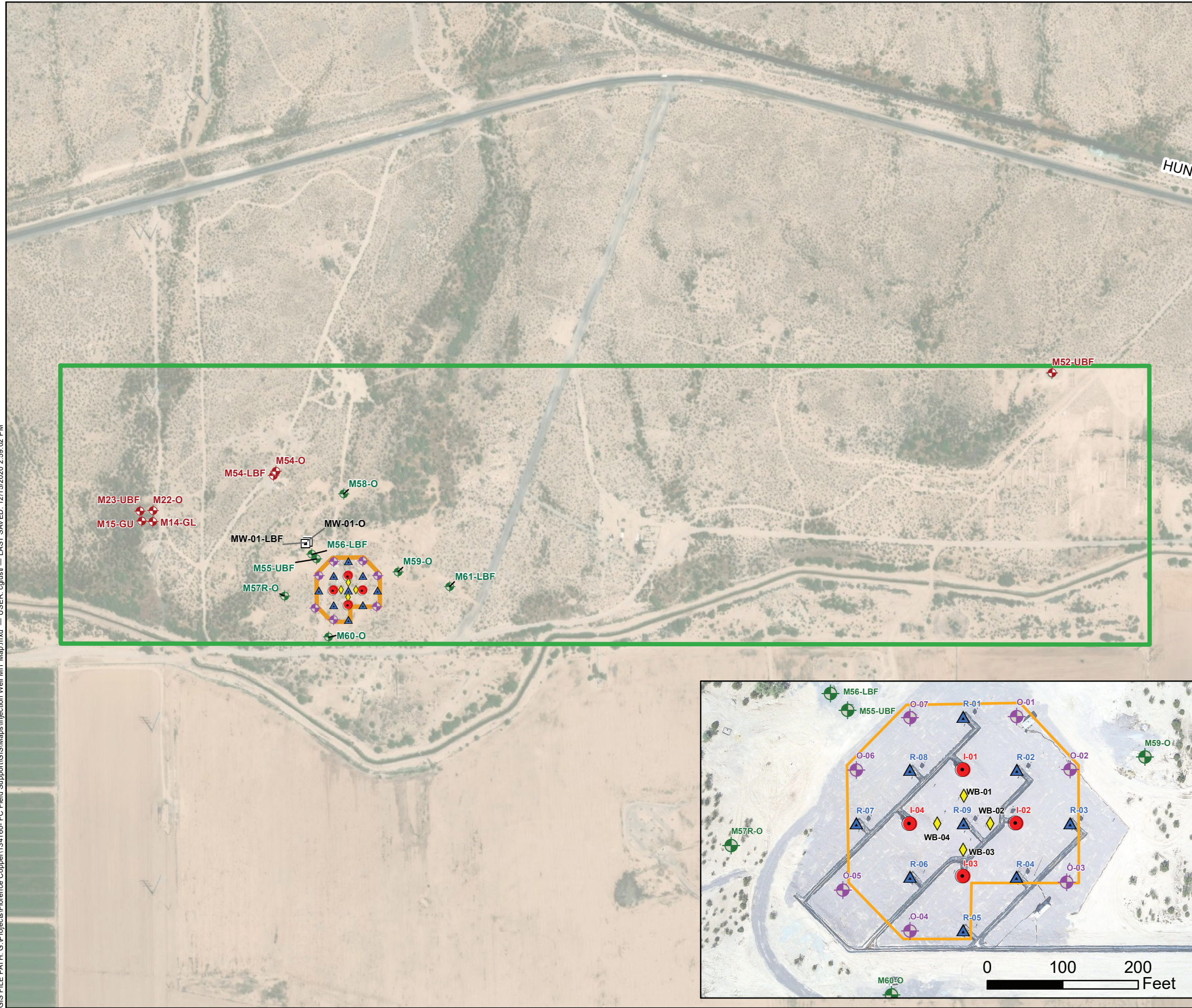
Appendix A – Completed Standard Annular Pressure Test Forms

Appendix B – Injection Well As-Built Diagrams

**FIGURE**



GIS FILE PATH: G:\Projects\Florence Copper\134160- FC Field Support\GIS\Maps\Injection Well MIT Map.mxd — USER: cglust — LAST SAVED: 12/15/2020 2:59:02 PM

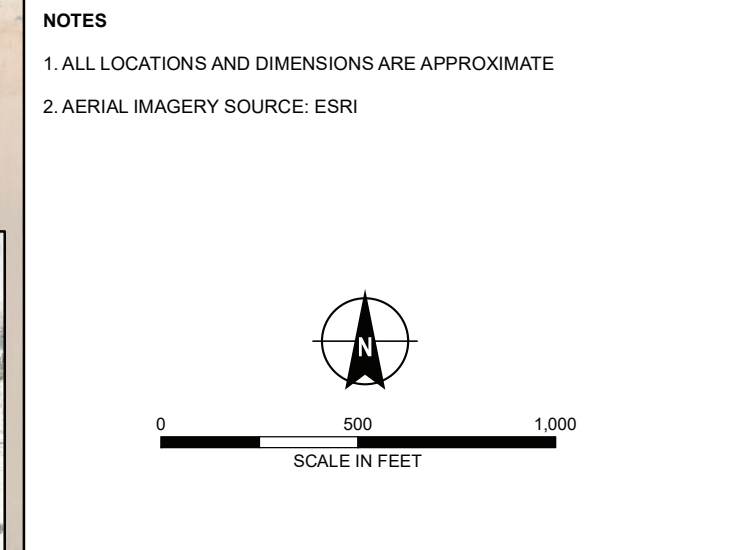


**LEGEND**

- INJECTION WELL
- RECOVERY WELL
- WESTBAY WELL
- OPERATIONAL WELL
- OBSERVATION WELL
- SUPPLEMENTAL MONITORING WELL
- POINT-OF-COMPLIANCE WELL
- STATE LAND LEASE
- PTF WELLFIELD

**NOTES**

- ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE
- AERIAL IMAGERY SOURCE: ESRI



**HALEY ALDRICH** FLORENCE COPPER PROJECT  
FLORENCE, ARIZONA

**FLORENCE COPPER** DECEMBER 2020

**WELL LOCATIONS**

**FIGURE 1**



## **APPENDIX A**

### **Completed Standard Annular Pressure Test Forms**

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
STANDARD ANNULAR PRESSURE TEST

Operator Florence Copper, Inc

State Permit No. P-101704

Address 1575 West Hunt Highway

USEPA Permit No. R9UIC-AZ3-FY11-1

Florence, AZ 5132

Date of Test 12/13/2021

Well Name I-01

Well Type Env-Injection-Class III

LOCATION INFORMATION SW Quarter of the NE Quarter of the SW Quarter

of Section 28; Range 9E; Township 4S; County Pinal;

Company Representative Ian Ream; Field Inspector Collin Giusti;

Type of Pressure Gauge Transducer inch face; 300 psi full scale; 0.001 psi increments;

New Gauge? Yes ☐ No ☒ If no, date of calibration 11/1/17 Calibration certification submitted? Yes ☐ No ☒

**TEST RESULTS**

Readings must be taken at least every 10 minutes for a minimum of 30 minutes for Class II, III and V wells and 60 minutes for Class I wells.

For Class II wells, annulus pressure should be at least 300 psig. For Class I wells, annulus pressure should be the greater of 300 psig or 100 psi above maximum permitted injection pressure.

Original chart recordings must be submitted with this form.

5-year or annual test on time? Yes ☒ No ☐

2-year test for TA'd wells on time? Yes ☐ No ☒

After rework? Yes ☐ No ☒

Newly permitted well? Yes ☐ No ☒

Time	Pressure (in psig)	
	Annulus	Tubing
11:48	162.073	same
11:58	161.972	same
12:08	161.877	same
12:18	161.626	same

Casing size 5-inch nominal

Tubing size AQ

Packer type inflatable packer

Packer set @ 3.18 FT (Top), 503.21 FT (Bottom)

Top of Permitted Injection Zone 418

Is packer 100 ft or less above top of

Injection Zone ? Yes ☒ No ☐

If not, please submit a justification.

Fluid return (gal.) 0.92

Comments:

Test Pressures: Max. Allowable Pressure Change: Initial test pressure x 0.03 4.862 psi  
Test Period Pressure change 0.447 psi

Test Passed ☒ Test Failed ☐

If failed test, well must be shut in, no injection can occur, and USEPA must be contacted within 24 hours. Corrective action needs to occur, the well retested, and written authorization received before injection can recommence.

I certify under penalty of law that this document and all attachments are, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations. (See 40 CFR 144.32(d))

Ian Ream

Printed Name of Company Representative



Signature of Company Representative

1-10-2022  
Date

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
STANDARD ANNULAR PRESSURE TEST

Operator Florence Copper, Inc.

State Permit No. P-101704

Address 1575 West Hunt Highway

USEPA Permit No. R9UIC-AZ3-FY11-1

Florence, AZ 85132

Date of Test 11/30/2021

Well Name I-02

Well Type Env-Injection-Class III

LOCATION INFORMATION SW SW Quarter of the NE NE Quarter of the SW SW Quarter of Section 28; Range 9E; Township 4S; County Pinal;

Company Representative Ian Ream; Field Inspector Collin Giusti;

Type of Pressure Gauge Transducer inch face; 300 psi full scale; .001 psi increments;

New Gauge? Yes ☐ No ☒ If no, date of calibration 11/1/2017 Calibration certification submitted? Yes ☐ No ☒

**TEST RESULTS**

Readings must be taken at least every 10 minutes for a minimum of 30 minutes for Class II, III and V wells and 60 minutes for Class I wells.

For Class II wells, annulus pressure should be at least 300 psig. For Class I wells, annulus pressure should be the greater of 300 psig or 100 psi above maximum permitted injection pressure.

Original chart recordings must be submitted with this form.

5-year or annual test on time? Yes ☒ No ☐

2-year test for TA'd wells on time? Yes ☐ No ☒

After rework? Yes ☐ No ☒

Newly permitted well? Yes ☐ No ☒

Time	Pressure (in psig)	
	Annulus	Tubing
14:01	149.333	same
14:11	149.514	same
14:21	149.956	same
14:31	150.479	same

Casing size 5-Inch nominal

Tubing size AQ

Packer type inflatable packer

Packer set @ 3.66 FT (Top), 503.56 (Bottom)

Top of Permitted Injection Zone 418

Is packer 100 ft or less above top of

Injection Zone ? Yes ☒ No ☐

If not, please submit a justification.

Fluid return (gal.) 0.65

Comments:

Test Pressures: Max. Allowable Pressure Change: Initial test pressure x 0.03 4.479 psi

Test Period Pressure change 1.146 psi

Test Passed ☒

Test Failed ☐

If failed test, well must be shut in, no injection can occur, and USEPA must be contacted within 24 hours. Corrective action needs to occur, the well retested, and written authorization received before injection can recommence.

I certify under penalty of law that this document and all attachments are, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations. (See 40 CFR 144.32(d))

Ian Ream

Printed Name of Company Representative

  
Signature of Company Representative

1-10-2022

Date



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
STANDARD ANNULAR PRESSURE TEST

Operator Florence Copper, Inc.

State Permit No. P-101704

Address 1575 West Hunt Highway

USEPA Permit No. R9UIC-AZ3-FY11-1

Florence, AZ 85132

Date of Test 12/06/2021

Well Name I-03

Well Type Env-Injection-Class III

LOCATION INFORMATION SW      Quarter of the NE      Quarter of the SW      Quarter of Section 28 ; Range 9E ; Township 4S ; County Pinal ;

Company Representative Ian Ream ; Field Inspector Collin Giusti ;

Type of Pressure Gauge Transducer inch face; 300 psi full scale; .001 psi increments;

New Gauge? Yes ☐ No ☒ If no, date of calibration 11/1/2017 Calibration certification submitted? Yes ☐ No ☒

**TEST RESULTS**

Readings must be taken at least every 10 minutes for a minimum of 30 minutes for Class II, III and V wells and 60 minutes for Class I wells.

For Class II wells, annulus pressure should be at least 300 psig. For Class I wells, annulus pressure should be the greater of 300 psig or 100 psi above maximum permitted injection pressure.

Original chart recordings must be submitted with this form.

5-year or annual test on time? Yes ☒ No ☐

2-year test for TA'd wells on time? Yes ☐ No ☒

After rework? Yes ☐ No ☒

Newly permitted well? Yes ☐ No ☒

Time	Pressure (in psig)	
	Annulus	Tubing
12:50	156.771	same
13:00	156.123	same
13:10	155.250	same
13:20	154.314	same

Casing size 5-Inch nominal

Tubing size AQ

Packer type inflatable packer

Packer set @ 3.15 FT (Top), 503.18 (Bottom)

Top of Permitted Injection Zone 418

Is packer 100 ft or less above top of

Injection Zone ? Yes ☒ No ☐

If not, please submit a justification.

Fluid return (gal.) 0.70

Comments:

Test Pressures: Max. Allowable Pressure Change: Initial test pressure x 0.03 4.703 psi  
Test Period Pressure change 2.457 psi

Test Passed ☒ Test Failed ☐

If failed test, well must be shut in, no injection can occur, and USEPA must be contacted within 24 hours. Corrective action needs to occur, the well retested, and written authorization received before injection can recommence.

I certify under penalty of law that this document and all attachments are, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations. (See 40 CFR 144.32(d))

Ian Ream  
Printed Name of Company Representative

  
Signature of Company Representative

1-10-2022  
Date

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
STANDARD ANNULAR PRESSURE TEST

Operator Florence Copper, Inc.

State Permit No. P-101704

Address 1575 West Hunt Highway

USEPA Permit No. R9UIC-AZ3-FY11-1

Florence, AZ 85132

Date of Test 12/17/2021

Well Name I-04

Well Type Env-Injection-Class III

LOCATION INFORMATION SW Quarter of the NE Quarter of the SW Quarter

of Section 28; Range 9E; Township 4S; County Pinal;

Company Representative Ian Ream; Field Inspector Collin Giusti;

Type of Pressure Gauge Transducer inch face; 300 psi full scale; .001 psi increments;

New Gauge? Yes ☐ No ☒ If no, date of calibration 11/1/2017 Calibration certification submitted? Yes ☐ No ☒

**TEST RESULTS**

Readings must be taken at least every 10 minutes for a minimum of 30 minutes for Class II, III and V wells and 60 minutes for Class I wells.

For Class II wells, annulus pressure should be at least 300 psig. For Class I wells, annulus pressure should be the greater of 300 psig or 100 psi above maximum permitted injection pressure.

Original chart recordings must be submitted with this form.

5-year or annual test on time? Yes ☒ No ☐

2-year test for TA'd wells on time? Yes ☐ No ☒

After rework? Yes ☐ No ☒

Newly permitted well? Yes ☐ No ☒

Time	Pressure (in psig)	
	Annulus	Tubing
10:19	156.124	same
10:29	156.883	same
10:39	157.886	same
10:49	158.750	same

Casing size 5-Inch nominal

Tubing size AQ

Packer type inflatable packer

Packer set @ 3.18 FT (Top), 503.21 (Bottom)

Top of Permitted Injection Zone 418

Is packer 100 ft or less above top of

Injection Zone ? Yes ☒ No ☐

If not, please submit a justification.

Fluid return (gal.) 0.83

Comments:

Test Pressures: Max. Allowable Pressure Change: Initial test pressure x 0.03 4.68 psi

Test Period Pressure change 2.62 psi

Test Passed ☒

Test Failed ☐

If failed test, well must be shut in, no injection can occur, and USEPA must be contacted within 24 hours. Corrective action needs to occur, the well retested, and written authorization received before injection can recommence.

I certify under penalty of law that this document and all attachments are, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations. (See 40 CFR 144.32(d))

Ian Ream

Printed Name of Company Representative



Signature of Company Representative

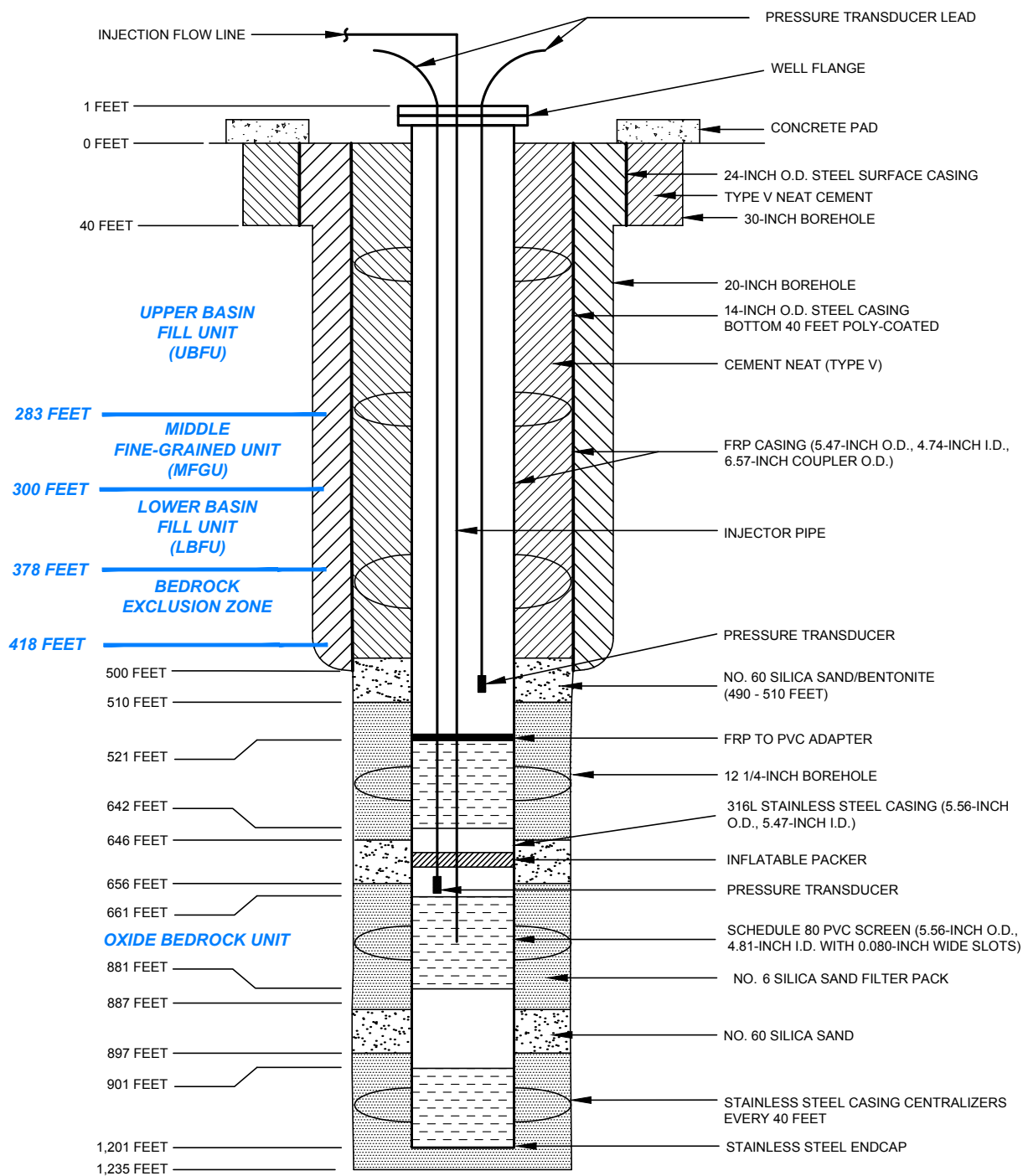
1-10-2022

Date

## **APPENDIX B**

### **Injection Well As-Built Diagrams**





#### NOTES

1. WELL REGISTRATION NO.: 55-227963
2. CADASTRAL LOCATION: D(4-9) 28 CAC
3. MEASURING POINT ELEVATION: 1482.67 FEET AMSL
4. I.D. = INSIDE DIAMETER
5. O.D. = OUTSIDE DIAMETER
6. PVC = POLYVINYL CHLORIDE
7. FRP = FIBERGLASS REINFORCED PLASTIC
8. SOUNDING TUBE INSTALLED TO ~500 FEET

**HALEY  
ALDRICH**

PRODUCTION TEST FACILITY  
FLORENCE COPPER, INC.  
FLORENCE, ARIZONA

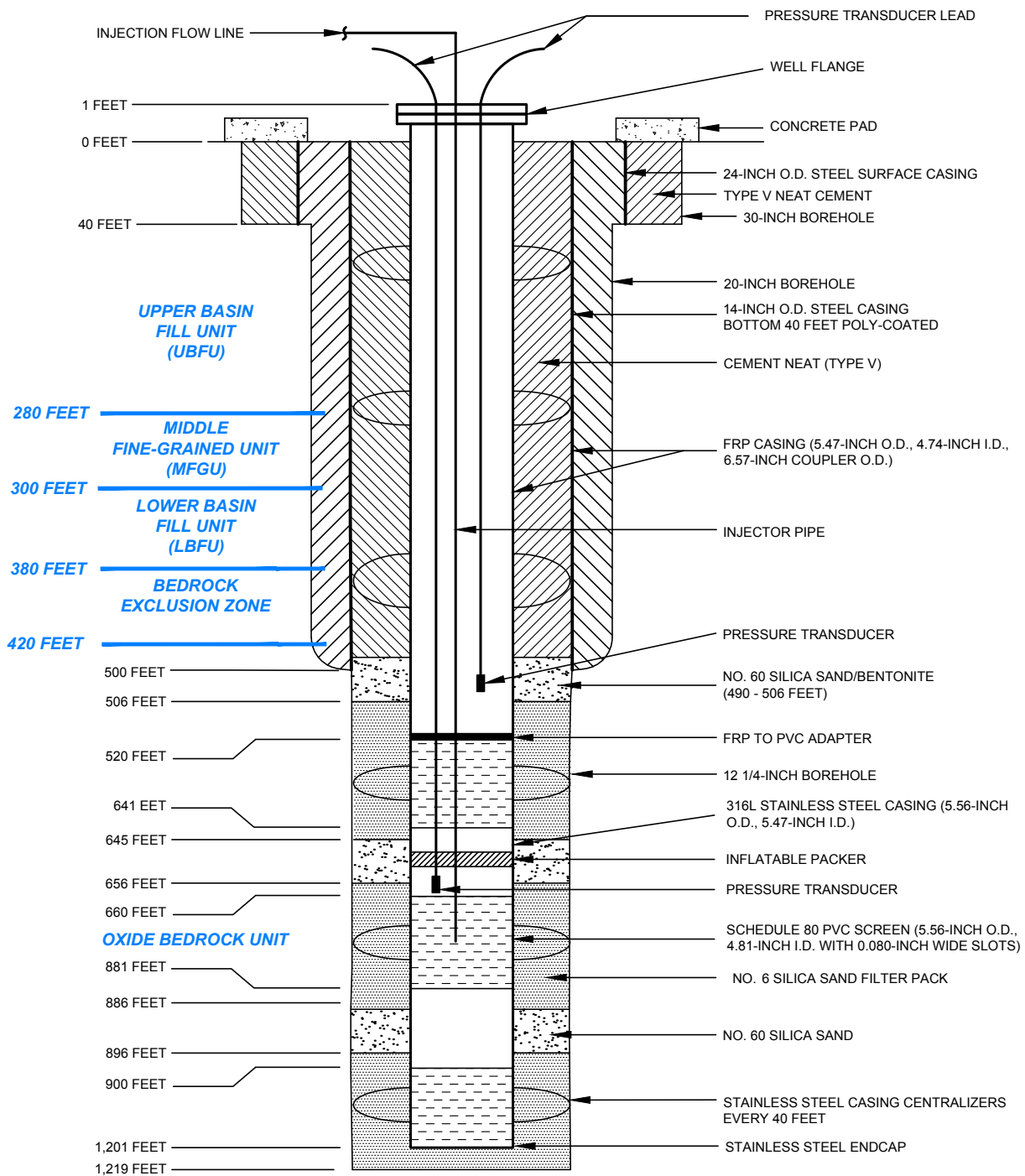
#### INJECTION WELL I-01 AS-BUILT DIAGRAM

**FLORENCE  
COPPER**

SCALE: NOT TO SCALE  
SEPTEMBER 2018

**FIGURE 4**





#### NOTES

1. WELL REGISTRATION NO.: 55-227964
2. CADASTRAL LOCATION: D(4-9) 28 CAC
3. MEASURING POINT ELEVATION: 1482.61 FEET AMSL
4. I.D. = INSIDE DIAMETER
5. O.D. = OUTSIDE DIAMETER
6. PVC = POLYVINYL CHLORIDE
7. FRP = FIBERGLASS REINFORCED PLASTIC
8. SOUNDING TUBE INSTALLED TO ~500 FEET

**HALEY  
ALDRICH**

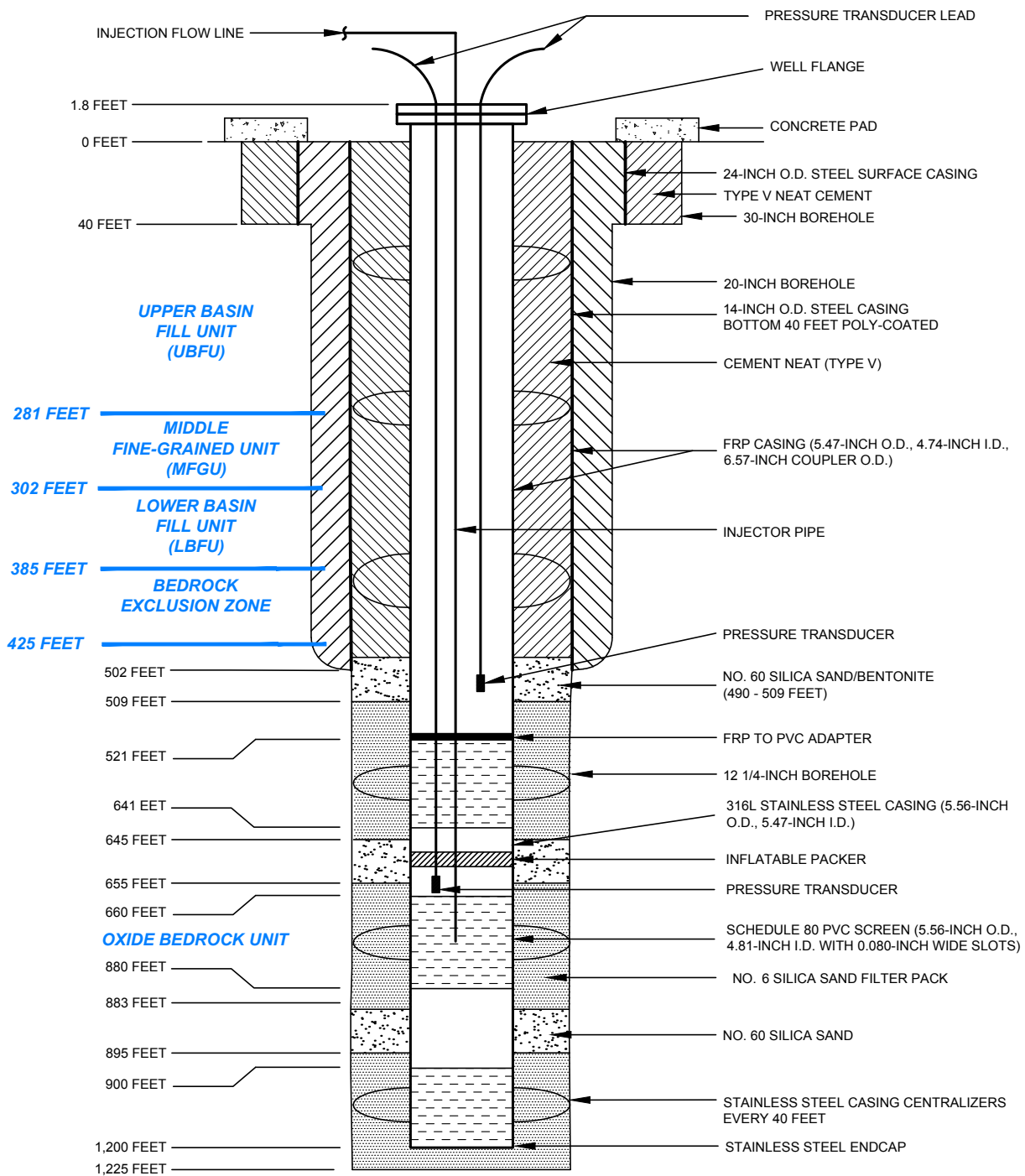
PRODUCTION TEST FACILITY  
FLORENCE COPPER, INC.  
FLORENCE, ARIZONA

#### INJECTION WELL I-02 AS-BUILT DIAGRAM

**FLORENCE  
COPPER**

SCALE: NOT TO SCALE  
SEPTEMBER 2018

FIGURE 4



#### NOTES

1. WELL REGISTRATION NO.: 55-227965
2. CADASTRAL LOCATION: D(4-9) 28 CAC
3. MEASURING POINT ELEVATION: 1480.71 FEET AMSL
4. I.D. = INSIDE DIAMETER
5. O.D. = OUTSIDE DIAMETER
6. PVC = POLYVINYL CHLORIDE
7. FRP = FIBERGLASS REINFORCED PLASTIC
8. SOUNDING TUBE INSTALLED TO ~500 FEET

**HALEY  
ALDRICH**

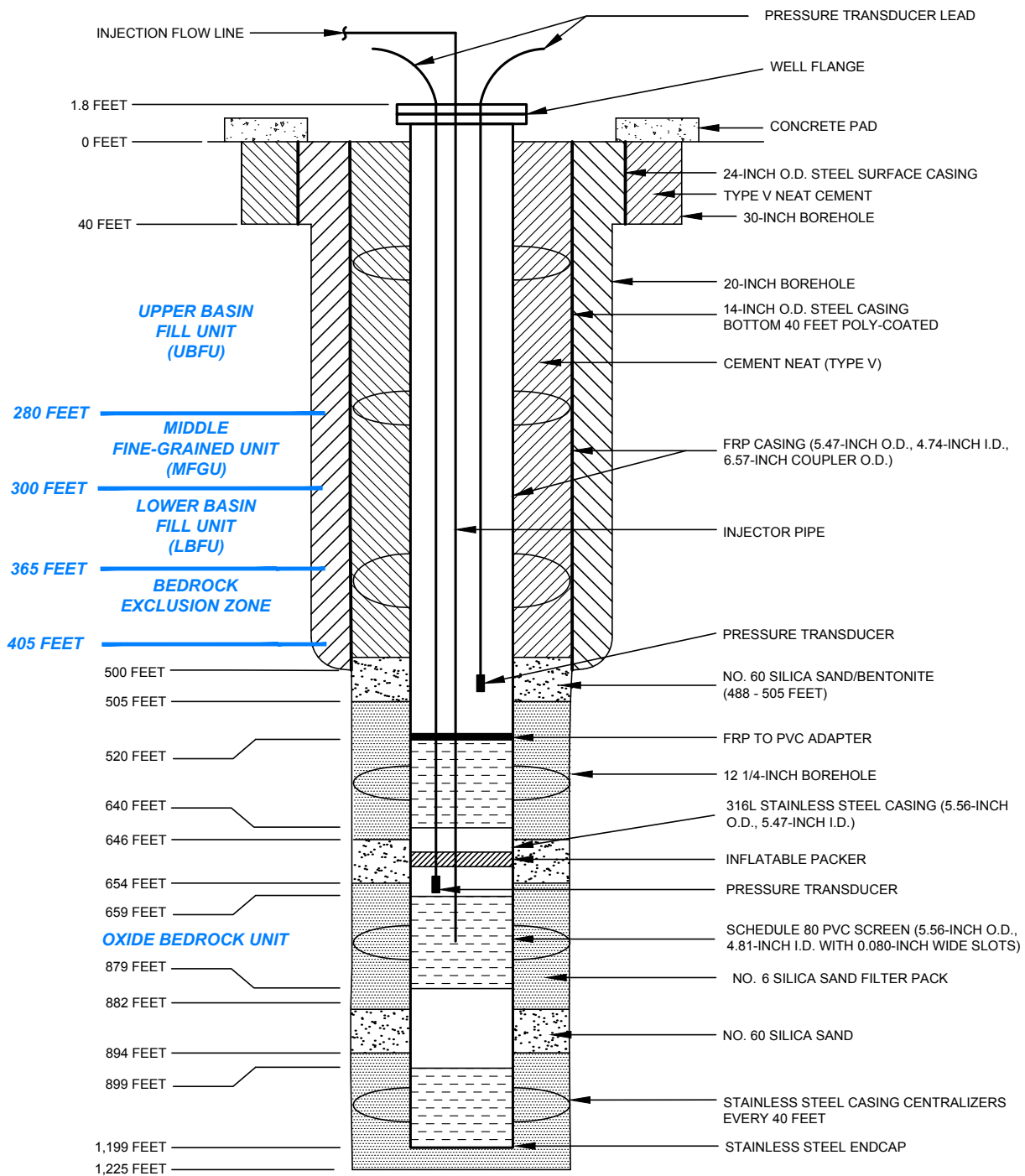
PRODUCTION TEST FACILITY  
FLORENCE COPPER, INC.  
FLORENCE, ARIZONA

#### I-03 INJECTION WELL AS-BUILT DIAGRAM

**FLORENCE  
COPPER**

SCALE: NOT TO SCALE  
SEPTEMBER 2018

FIGURE 4



#### NOTES

1. WELL REGISTRATION NO.: 55-227966
2. CADASTRAL LOCATION: D(4-9) 28 CBD
3. MEASURING POINT ELEVATION: 1482.16 FEET AMSL
4. I.D. = INSIDE DIAMETER
5. O.D. = OUTSIDE DIAMETER
6. PVC = POLYVINYL CHLORIDE
7. FRP = FIBERGLASS REINFORCED PLASTIC
8. SOUNDING TUBE INSTALLED TO ~500 FEET

**HALEY  
ALDRICH**

PRODUCTION TEST FACILITY  
FLORENCE COPPER, INC.  
FLORENCE, ARIZONA

#### I-04 INJECTION WELL AS-BUILT DIAGRAM

**FLORENCE  
COPPER**

SCALE: NOT TO SCALE  
SEPTEMBER 2018

**FIGURE 4**